



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/674,551

10/01/2003

Yuichi Sato

04208.0190

5732

22852

7590

02/02/2007

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER
LLP

901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER

BAREFORD, KATHERINE A

ART UNIT

PAPER NUMBER

1762

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
----------------------------------------	-----------	---------------

3 MONTHS

02/02/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/674,551

Applicant(s)

SATO ET AL.

Examiner

Katherine A. Bareford

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 1-6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/03, 4/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-6 in the reply filed on January 18, 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claim 7 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on January 18, 2007.

Information Disclosure Statement

3. The information disclosure statement filed October 1, 2003 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

Applicant refers to Japan 32-50519 as being discussed in the cited US references US 6,286,207, etc. However, when reviewing those US references, the Examiner found no mention of Japan 32-50519.

Claim Objections

4. Claim 1 is objected to because of the following informalities: in claim 1, lines 7 and 12, "said resinous substrate" should be "said resinous base" to correspond to the term used at claim 1, line 4.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, lines 1, 4, and 13, forming a "thin" film is claimed, but no indication is made as to what thickness is required to be considered "thin", and thus, the claim is unclear as to the term. This reference to a "thin" film is also found in claims 2-6.

Claim 5, lines 5-6, "relatively low deposition speed" is unclear as to what speed is required for the speed to be considered "relatively low", and thus the claim is unclear as to the term.

The other dependent claims do not cure the defects of the claims from which they depend.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Zeblisky (US 3672923).

Zeblisky teaches a method for forming a thin film. See column 11, lines 20-45. A resinous base can be provided. Column 4, lines 24-30. A predetermined preliminary treatment can be carried out on the base. Column 4, line 70 through column 5, line 25 (such as cleaning). Then a catalyst applying treatment is provided on the resinous base that has been pretreated. Column 4, lines 70-75, column 5, lines 45-65 and column 10, lines 30-50. The treatment solution is provided with a predetermined amount of fluorine type anionic surfactant (wetting agent). Column 10, lines 45-55, column 6, lines 55-75, column 7, lines 20-50 and column 8, lines 25-40. The use of the surfactant is to inhibit the oxidation of Group IV metals (such as tin) and the reduction of the precious metals (such as palladium). Column 6, lines 55-70. Then, electroless plating is carried

out on the resinous base that has been subjected to the catalyst applying treatment to form the thin film. Column 11, lines 20-35.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeblisky as applied to claim 1 above, and further in view of Yang et al (US 2002/0028293).

Zeblisky teaches all the features of this claim except that the substrate is a liquid crystal polymer film with no filler.

Art Unit: 1762

Yang teaches that it is known to use as a resinous substrate for electroless plating of metal such as copper ~~is~~ liquid crystal polymer film that has been given a catalyst pretreatment. Paragraph [0032]. No filler is described as being used in the film.

Paragraph [0022]

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Zeblisky to use liquid crystal polymer film that does not contain filler as the resinous base as suggested by Yang with an expectation of providing a desirably coated surface because Zeblisky teaches copper electroless plating on resinous substrates using copper plating baths, and Yang teaches that a known resinous surface for electroless copper plating is liquid crystal polymer films with no filler.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeblisky (US 3672923).

Zeblisky teaches all the features of this claim, as discussed in the 35 USC 102(b) rejection using Zeblisky above, except that the plating is performed using a copper plating bath having a relatively low deposition speed. Zeblisky does teach that conventional electroless copper plating baths can be used where the base is immersed (dipped) in the bath. Column 4, lines 1-15 and column 11, lines 25-35.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Zeblisky to use a copper plating bath with a "relatively

low deposition speed" with an expectation of desirable plating performance, because Zeblisky teaches that conventional copper plating baths can be used, which would be inclusive of both low and high speed baths.

13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeblisky as applied to claim 5 above, and further in view of Wilks (US 3930072).

Zeblisky teaches all the features of this claim except that the copper plating bath has potassium sodium tartrate as a complexing agent. As discussed in the rejection above, Zeblisky teaches that conventional copper plating baths can be used. Column 11, lines 25-35.

Wilks teaches that a conventional electroless copper plating bath is one that contains potassium sodium tartrate, which would be a complexing agent as defined. Column 4, lines 55-60.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Zeblisky to use an electroless copper plating bath containing potassium sodium tartrate as suggested by Wilks with an expectation of providing a desirably coated surface because Zeblisky teaches copper electroless plating on resinous substrates using conventional copper plating baths, and Wilks teaches that a conventional copper electroless plating bath includes potassium sodium tartrate.

14. Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steffen (US 4040197) in view of Zeblisky (US 3672923).

Steffen teaches a method for forming a copper film. See column 3, lines 1-10 and column 5, lines 5-10. A resinous base is provided. Column 1, lines 55-60. A predetermined preliminary treatment can be carried out on the base. Column 4, lines 45-60 (such as cleaning or etching). Then a catalyst applying treatment is provided on the resinous base that has been pretreated. Column 3, lines 1-10 and column 4, lines 55-68. The treatment solution is provided with a predetermined amount of fluorine type surfactant (surface active, wetting agent). Column 2, lines 40-45 and column 4, lines 60-65. Then, electroless copper plating using a copper plating bath is carried out on the resinous base that has been subjected to the catalyst applying treatment to form the copper film. Column 5, lines 5-10.

Steffen teaches all the features of these claims except that the formed film is "thin", that the surfactant is anionic, and that the copper bath has a "relatively low deposition speed" (claim 5). Steffen does teach that "known" copper plating baths can be used. Column 5, lines 5-10.

However, Zeblisky teaches a method for forming a thin film. See column 11, lines 20-45. A resinous base can be provided. Column 4, lines 24-30. A predetermined preliminary treatment can be carried out on the base. Column 4, line 70 through column 5, line 25 (such as cleaning). Then a catalyst applying treatment is provided on the resinous base that has been pretreated. Column 4, lines 70-75, column 5, lines 45-65

Art Unit: 1762

and column 10, lines 30-50. The treatment solution is provided with a predetermined amount of fluorine type anionic surfactant (wetting agent). Column 10, lines 45-55, column 6, lines 55-75, column 7, lines 20-50 and column 8, lines 25-40. The use of the surfactant is to inhibit the oxidation of Group IV metals (such as tin) and the reduction of the precious metals (such as palladium). Column 6, lines 55-70. Then, electroless plating is carried out on the resinous base that has been subjected to the catalyst applying treatment to form the thin film. Column 11, lines 20-35.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Steffen to provide that the formed copper film is "thin" and that the fluorine type surfactant is anionic as suggested by Zeblisky with an expectation of providing a desirably coated surface because Steffen teaches copper electroless plating on resinous substrates with a pretreatment to catalyze using a fluorine type surfactant, and Zeblisky teaches that copper electroless plating on resinous substrates is desirably used to form relatively thin films and that fluorine type surfactants used in pretreatments to catalyze the substrate are desirably anionic. It would further have been obvious to modify Steffen in view of Zeblisky to use a copper plating bath with a "relatively low deposition speed" with an expectation of desirable plating performance, because Steffen teaches that known copper plating baths can be used, which would be inclusive of both low and high speed baths.

15. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Steffen in view of Zeblisky as applied to claims 1 and 5 above, and further in view of Yang et al (US 2002/0028293).

Steffen in view of Zeblisky teaches all the features of this claim except that the substrate is a liquid crystal polymer film with no filler.

Yang teaches that it is known to use as a resinous substrate for electroless plating of metal such as copper ~~in~~ liquid crystal polymer film that has been given a catalyst pretreatment. Paragraph [0032]. No filler is described as being used in the film. Paragraph [0022]

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Steffen in view of Zeblisky to use liquid crystal polymer film that does not contain filler as the resinous base as suggested by Yang with an expectation of providing a desirably coated surface because Steffen in view of Zeblisky teaches copper electroless plating on resinous substrates using known copper plating baths, and Yang teaches that a known resinous surface for electroless copper plating is liquid crystal polymer films with no filler.

16. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Steffen in view of Zeblisky as applied to claims 1 and 5 above, and further in view of Wilks (US 3930072).

Steffen in view of Zeblisky teaches all the features of this claim except that the copper plating bath has potassium sodium tartrate as a complexing agent. As discussed in the rejection above, Steffen teaches that "known" copper plating baths can be used. Column 5, lines 5-10.

Wilks teaches that a known electroless copper plating bath is one that contains potassium sodium tartrate, which would be a complexing agent as defined. Column 4, lines 55-60.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Steffen in view of Zeblisky to use an electroless copper plating bath containing potassium sodium tartrate as suggested by Wilks with an expectation of providing a desirably coated surface because Steffen in view of Zeblisky teaches copper electroless plating on resinous substrates using known copper plating baths, and Wilks teaches that a known copper electroless plating bath includes potassium sodium tartrate.

17. Claims 1, 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al (US 2002/0028293) in view of Zeblisky (US 3672923).

Yang teaches a method for forming an electroless metal film of copper, nickel, etc.. See paragraphs [0032] and [0057] – [0059]. A resinous base is provided. Paragraphs [0032] and [0057] – [0059]. A predetermined preliminary treatment can be carried out on the base. Paragraph [0057] (such as etching). Then a catalyst applying

treatment is provided on the resinous base that has been pretreated. Paragraphs [0032] and [0057] (first immersion in a tin chloride solution sensitizing treatment and then immersion in a activation treatment with a palladium chloride solution). Then, electroless plating using a plating bath is carried out on the resinous base that has been subjected to the catalyst applying treatment to form the copper, nickel, etc. film. Paragraphs [0032] and [0057] – [0059].

Claim 2: the resinous base can be liquid crystal polymer film. Paragraphs [0032] and [0057]. No filler is described as being used in the film. Paragraph [0022].

Yang teaches all the features of these claims except that the formed film is “thin”, that a fluorine type anionic surfactant is used in the catalyst pretreatment, and that the copper bath has a “relatively low deposition speed” (claim 5).

However, Zeblisky teaches a method for forming a thin film. See column 11, lines 20-45. A resinous base can be provided. Column 4, lines 24-30. A predetermined preliminary treatment can be carried out on the base. Column 4, line 70 through column 5, line 25 (such as cleaning). Then a catalyst applying treatment is provided on the resinous base that has been pretreated. Column 4, lines 70-75, column 5, lines 45-65 and column 10, lines 30-50. The treatment solution is provided with a predetermined amount of fluorine type anionic surfactant (wetting agent). Column 10, lines 45-55, column 6, lines 55-75, column 7, lines 20-50 and column 8, lines 25-40. The use of the surfactant is to inhibit the oxidation of Group IV metals (such as tin) and the reduction of the precious metals (such as palladium). Column 6, lines 55-70. Then, electroless

plating is carried out on the resinous base that has been subjected to the catalyst applying treatment to form the thin film. Column 11, lines 20-35.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yang to provide that the formed copper film is "thin" and that a predetermined amount of anionic fluorine type surfactant is used in the catalyst pretreatment bath as suggested by Zeblisky with an expectation of providing a desirably coated surface because Yang teaches copper, nickel, etc. electroless plating on resinous substrates with a pretreatment to catalyze, and Zeblisky teaches that copper, etc. electroless plating on resinous substrates is desirably used to form relatively thin films and that a predetermined amount of anionic fluorine type surfactants are used in pretreatments to catalyze the substrate so as to beneficially inhibit the oxidation of Group IV metals (such as tin) and the reduction of the precious metals (such as palladium), and thus it would be obvious to use these surfactants in both solutions containing tin and in solutions containing palladium, with beneficial results for both. It would further have been obvious to modify Yang in view of Zeblisky to use a copper plating bath with a "relatively low deposition speed" with an expectation of desirable plating performance, because Yang teaches copper plating baths can be used with no limitation on what bath is to be used, which would be inclusive of both low and high speed baths.

18. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Zeblisky as applied to claims 1, 2 and 5 above, and further in view of Luft (US 4154869).

Yang in view of Zeblisky teaches all the features of these claims except that the catalyst pretreatment, using a series of sensitizing treatment and activation treatment, is continuously repeated a plurality of times. As discussed in the rejection above, Yang teaches that a sensitizing treatment using a solution containing tin chloride can be used followed by an activation treatment using a solution containing palladium chloride as the catalyst treatment. Paragraph [0057]. Further discussed in the rejection above is the obviousness of using anionic fluorine type surfactant in both solutions.

Luft teaches that when electrolessly plating a non-conductive surface using a sensitizing treatment with tin chloride followed by an activation treatment using palladium chloride before electrolessly plating, it is well known to continuously repeat these steps a plurality of times before electrolessly plating to get proper preparation of the surface. Column 2, lines 10-35 and 50-68 and column 3, lines 5-60.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yang in view of Zeblisky to use repeated sensitizing and activation steps as suggested by Luft with an expectation of providing a desirably coated surface because Yang in view of Zeblisky teaches electroless plating on resinous substrates using sensitizing and activation pretreatments, and Luft teaches that when using sensitizing and activation pretreatments before electrolessly plating, it is well

known to repeat these steps a plurality of times before electrolessly plating to get proper preparation of the surface.

19. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Zeblisky as applied to claims 1, 2 and 5 above, and further in view of Wilks (US 3930072).

Yang in view of Zeblisky teaches all the features of this claim except that the copper plating bath has potassium sodium tartrate as a complexing agent. Yang teaches that copper plating baths can be used. Paragraphs [0032] and [0057].

Wilks teaches that a known electroless copper plating bath is one that contains potassium sodium tartrate, which would be a complexing agent as defined. Column 4, lines 55-60.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yang in view of Zeblisky to use an electroless copper plating bath containing potassium sodium tartrate as suggested by Wilks with an expectation of providing a desirably coated surface because Yang in view of Zeblisky teaches copper electroless plating on resinous substrates using copper plating baths, and Wilks teaches that a known copper electroless plating bath includes potassium sodium tartrate.

Conclusion


Art Unit: 1762

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


KATHERINE BAREFORD
PRIMARY EXAMINER